REMARKS/ARGUMENTS

The Examiner is thanked for the review of the application.

Claims 1-6 remain in this application. Claims 1 and 3 have been amended. No new matter has been added.

In the Office Action dated January 24, 2006, the Examiner has objected the Specification stating that "the 'Attorney Docket Number DEM1P002)' should be deleted and the status of the application should be entered as follows: Pending or Allowed and the Patent Number or Abandoned. Correction is required." In page 1 of the specification, the paragraph beginning at line 12 has been amended to comply with MPEP 608.01(b).

Also in the Office Action dated January 24, 2006, The Examiner has rejected Claims 1-4 under 35 U.S.C. 103(a) as being unpatentable over (US 5,377,095) Maeda et al., hereinafter Maeda.

Regarding Claim 1, the Examiner has stated that "Maeda teaches, A computer-implemented method for modeling cost, comprising the steps of: receiving sales data, cleaning the sales data and generating imputed variables; receiving cost data (col. 4, lines 1-47); and estimating cost per unit of product from the sales data the imputed variables and the cost data (col. 4, lines 65-col. 5, line 63). Maeda did not expressly disclose receiving cost data, but it would have been obvious to one having ordinary skill in the art at the time the invention was made to receive cost data in view of Maeda's teachings of a sales table, a retrieved price and a predicted sale and because such a modification would allow Maeda to have the cost data prior to estimating the cost per unit of product from the sales data (performing a mathematical calculation)."

Regarding Claim 2, the Examiner has stated that "Maeda teaches, the computer-implemented method, as recited in claim 1, wherein the determining the cost per unit of product comprises estimating inventory space in the store used by the product, which is estimated from sales data indicating volume of sales of the product and cost data indicating the frequency of product delivery (col. 7, lines 24-49)."

Claim 1 has now been amended to recite, in relevant part:

"receiving sales data, cleaning the sales data and generating imputed variables, wherein said imputed variables are generated by making at least one posterior inference to impute missing data when at least one data point is missing." (emphasis added).

Support for the amendment may be found on page 14, lines 1-2 of the specification as filed.

Maeda does not teach nor suggest generating imputed econometric variables by inferring useful variables from missing or incomplete data sets. Maeda uses a merchandise analysis system to generate a sales model in order to predict sales based on past actual sales data. (Col. 1, lines 7 – 9). In the section cited by the Examiner (Col. 4, lines 1 – 47) Maeda discloses "an input device . . . through which a user inputs information . . . to be analyzed." (lines 1 – 3) (emphasis added). The information is used to create a sales model for predicting future sales. (lines 26 – 28). Nowhere does Maeda teach nor suggest imputing data to generate imputed variables from incomplete data sets.

In the instant invention, on the other hand, imputation is used to obtain posterior inference when some data points are missing or data sets are incomplete in order to generate useful econometric variables. A novel and advantageous aspect of the current invention is that even when various product parameters are missing or incomplete, they may be imputed according to the present invention. (See page 14, lines 1-2 of the specification as filed). For example, when information regarding promotional variables is missing or incomplete, other data such as sales volume is used to impute a refined promotional variable (page 45, lines 5-18 of the specification as filed).

An example of advantageously using the novel imputation aspect of the instant invention to infer base price variables is given in the specification on page 24, lines 15 – 23, and page 25, lines 1 -2. Here, a base price variable is _inferred_ from the cleansed data set for a specific time window. Said base price variable may advantageously be further refined by, for example, correcting for promotional pricing (See, page 26, lines 2 – 22). Promotional prices are _inferred_ form the cleansed data set and used to impute a refined base price variable.

Maeda does not teach nor suggest the _imputation_ steps as recited in the claims of the instant invention. The imputation step solves the problem of generating econometric variables from missing or incomplete data sets. Maeda does not generate such variables but simply determines a sales model by using past sales data to predict future sales. The instant invention, on the other hand, takes point of sale information for various products, which may have missing or incomplete data, and imputes useful variables which may then be used for optimization or other useful purposes. (See, specification, p. 23, lines 4 – 7). Imputation of econometric variables is neither taught nor suggested in the prior art. Hence, base claim 1, and claims 2 and 5 which depend from claim 1, are allowable over the cited art.

Regarding Claim 3, the Examiner has stated that "Maeda teaches, An apparatus for modeling costs, using in association with an optimization engine, wherein the optimization engine is configured to receive input from the apparatus, and wherein the optimization engine is further configured to generate a preferred set of prices, the apparatus comprising: an econometric engine for receiving sales data, cleaning the sales data and generating imputed variables; and a financial engine for receiving imputed variables from the econometric engine, receiving cost data, generating a cost model, and outputting the cost model to the optimization engine (col. 12, line 16-col. 13, line 47)."

Regarding Claim 4, the Examiner has stated that "Maeda failed to teach, The apparatus, as recited in claim 3, wherein the financial engine estimates inventory space in a store used by a product from the sales data and delivery data. Official Notice is taken that it is old and well

known in the art of the estimating inventory space in a store used by a product from the sales and delivery data. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a financial engine that estimates inventory space in a store used by a product from the sales data and delivery data and to modify in Maeda because such a modification would allow Maeda to have the ability to calculate the inventory space need by each product prior to being sold to a customer."

Claim 3 has now been amended to recite, in relevant part:

"an econometric engine for receiving sales data, cleaning the sales data and <u>generating imputed variables, wherein said imputed variables are generated by making at least one posterior inference to impute missing data when at least one data point is missing</u>" (emphasis added).

Support for the amendment may be found on page 14, lines 1-2 of the specification as filed.

As discussed above, Maeda does not teach nor suggest the <u>imputation</u> steps as recited in the claims of the instant invention. The imputation step solves the problem of generating econometric variables from missing or incomplete data sets. Maeda does not generate · such variables but simply determines a sales model by using past sales data to predict future sales. The instant invention, on the other hand, takes point of sale information for various products, which may have missing or incomplete data, and imputes useful variables which may then be used for optimization or other useful purposes. (See, specification, p. 23, lines 4 – 7). Imputation of econometric variables is neither taught nor suggested in the prior art. Hence, base claim 3, and claims 4 and 6 which depend from claim 3, are allowable over the cited art.

The Examiner has also rejected Claims 5 and 6 under 35 U.S.C. 103(a) as being unpatentable over (US 5,377,095) Maeda et al., hereinafter Maeda in view of Alan L. Montgomery and Peter E. Rossi, hereinafter Montgomery and Rossi.

Regarding Claim 5, the Examiner has stated that "Maeda failed to teach, the computer-implemented method, as recited in claim 1, wherein the imputed variables include at least one of

a seasonality variable, a promotional variable and a cross-elasticity variable. Montgomery and Rossi teach, wherein the imputed variables include at least one of a seasonality variable, a promotional variable and a cross-elasticity variable (Page 418, col. 1-page 419, col. 1, page 421, col. 2, paragraph 2-page 422, col. 1, paragraph 1). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the imputed variables include at least one of a seasonality variable, a promotional variable and a cross-elasticity variable and to modify in Maeda because such a modification would allow Maeda to rely on a demand system and associated price elasticities."

Regarding Claim 6, the Examiner has stated that "Maeda failed to teach, The apparatus, as recited in claim 3, wherein the imputed variables include at least one of a seasonality variable, a promotional variable and a cross-elasticity variable. Montgomery and Rossi teach, wherein the imputed variables include at least one of a seasonality variable, a promotional variable and a cross-elasticity variable (page 414, col. 2, paragraph 2-page 415, paragraph 1). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the imputed variables include at least one of a seasonality variable, a promotional variable and a cross-elasticity variable and to modify in Maeda because such a modification would allow Maeda to have the basic pricing decisions and market structure analyses based on the parameters of a demand system for a group of related products and to estimate the own and cross-price elasticities for all major items in one category."

As discussed above, Maeda does not teach nor suggest the imputation steps as recited in the claims of the instant invention. Furthermore, Montgomery and Rossi does not teach nor suggest generation of imputed variables as disclosed by the instant invention. Montgomery and Rossi disclose an improved method for estimating price elasticities. The method in Montgomery and Rossi uses Bayesian modeling to give an improved estimation of price elasticities over existing least squares models. (See page 418, col. 1). The instant invention, on the other hand, imputes missing data from incomplete data sets in order to generate imputed variables to model costs. As discussed above, the instant invention provides the advantage of allowing for effective

modeling from missing or incomplete data sets. The novel imputation step is not taught by any of the cited prior art. Hence, claims 5 and 6 are allowable over the cited art.

In sum, base Claims 1 and 3 have been amended and are now believed to be allowable. Dependent claims 2 and 4 – 6, which depend therefrom are also believed to be allowable as being dependent from their respective patentable parent claims for at least the same reasons. Applicants believe that all pending Claims 1-6 are now allowable over the cited art and are also in allowable form and respectfully request a Notice of Allowance for this application from the Examiner. The commissioner is authorized to charge any fees that may be necessary to facilitate the filing of this response to our Deposit Account No. 50-2766 (Order No. DEM1P004). Should the Examiner believe that a telephone conference would expedite the prosecution of this application; the undersigned can be reached at telephone number 925-570-8198.

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